

What is claimed is:

1. An article comprising:

a gasoline engine having an exhaust outlet; and

5 a close coupled catalyst in communication with the exhaust outlet, the close coupled catalyst comprising a close coupled catalyst composition having substantially no oxygen storage components, the catalyst composition comprising:

a support;

a palladium component;

10 optionally, at least one alkaline metal oxide selected from the group consisting of strontium oxide, calcium oxide and barium oxide;

15 optionally, at least one platinum group metal component selected from the group consisting of platinum, rhodium, ruthenium and iridium components;

optionally, at least one rare earth oxide selected from the group consisting of neodymium oxide and lanthanum oxide; and

optionally, a second zirconium oxide.

20 2. The article as recited in claim 1 further comprising at least one rare earth oxide selected from the group consisting of neodymium oxide and lanthanum oxide.

25 3. The article as recited in claim 1 further comprising neodymium oxide and lanthanum oxide.

4. The article as recited in claim 1 further comprising a second zirconium oxide.

30 5. The article as recited in claim 1 wherein the support comprises at least one compound selected from the group consisting of silica, alumina, titania and first zirconia compounds.

35 6. The article as recited in claim 5 wherein the support comprises at least one activated compounds selected from the group consisting of alumina, silica, second zirconia and silica-

alumina, alumina-silicates, alumina-zirconia, alumina-chromia, and alumina-ceria.

7. The layered catalyst composite as recited in claim 6
5 wherein the support comprises activated alumina.

8. The article as recited in claim 1 wherein the alkaline metal oxide is strontium oxide.

10 9. The article as recited in claim 1 wherein the close coupled catalyst further comprises a the close coupled catalyst carrier which supports the close coupled catalyst composition.

15 10. The article as recited in claim 9 wherein the carrier comprises a honeycomb carrier.

11. The article as recited in claim 10 wherein there is:
from about 0.50 to about 3.5 g./in³ of activated
alumina
support;
at least about 50.0 g/ft³ of the palladium component;
and
from about 0.05 to about 0.5 g/in³ of at least one
alkaline earth metal component.

25 12. The article as recited in claim 11 wherein there is:
from about 0.05 g/in³ to about 0.4 g/in³ of strontium oxide;
from about 0.0 to about 0.5 g/in³ of the second
30 zirconium oxide; and
from about 0.0 to about 0.5 g/in³ of at least one rare earth metal oxide selected from the group consisting of lanthanum oxide and neodymium oxide.

35 13. The article as recited in claim 11 wherein there is:
up to about 20.0 g/ft³ of a rhodium component.

14. The article as recited in claim 11 wherein there is:
up to about 60.0 g/ft³ of a platinum component.

15. The article as recited in claim 11 wherein there is:
5 from about 75 to about 300 g/ft³ of the palladium component.

16. The article as recited in claim 10 wherein there is:
from about 75 to about 300 g/ft³ of the palladium
component;

10 from about 0.75 to about 2.0 g/in³ of activated alumina
support;

from about 0.05 g/in³ to about 0.4 g/in³ of strontium
oxide;

from about 0.05 to about 0.2 g/in³ of barium oxide;

15 from about 0.025 to about 0.3 g/in³ of lanthanum oxide;

from about 0.025 to about 0.3 g/in³ of neodymium
oxide; and

20 from about 0.05 to about 0.5 g/in³ of the second
zirconium oxide.

17. The article as recited in claim 1 further comprising
a three way catalyst downstream and in communication with the
close coupled catalyst.

25 18. The article as recited in claim 1 further comprising
a downstream catalyst located downstream of and in communication
with the close-coupled catalyst, the downstream catalyst
comprising an oxygen storage component.

30 19. An article comprising:
a gasoline engine having an exhaust outlet;
a close coupled catalyst in communication with the exhaust
outlet, the close coupled catalyst comprising a close coupled
catalyst composition having substantially no oxygen storage
35 components selected from the group consisting of cerium
components and praseodymium components, the catalyst composition
comprising:

5 a support;

a palladium component;

optionally, at least one alkaline metal oxide selected from the group consisting of strontium oxide, calcium oxide and barium oxide;

optionally, at least one platinum group metal component selected from the group consisting of platinum, rhodium, ruthenium and iridium components;

optionally, at least one rare earth oxide selected from the group consisting of neodymium oxide and lanthanum oxide; and

optionally, a second zirconium oxide; and

a downstream catalyst located downstream of and in communication with the close-coupled catalyst, the downstream catalyst comprising an oxygen storage component selected from the group consisting of cerium components and praseodymium components.

20. A method comprising the steps of:

operating a gasoline engine, having an exhaust gas outlet;

passing an exhaust gas stream comprising carbon monoxide and hydrocarbons, and optionally nitrogen oxide, from the exhaust gas outlet of the gasoline engine to a close coupled catalyst, the close coupled catalyst comprising a close coupled catalyst composition;

contacting the exhaust gas with the close coupled catalyst composition, the close coupled catalyst composition having substantially no oxygen storage components, the catalyst composition comprising:

30 a support;

a palladium component;

optionally, at least one alkaline metal oxide selected from the group consisting of strontium oxide, calcium oxide and barium oxide;

optionally, at least one platinum group metal component selected from the group consisting of platinum, rhodium, ruthenium and iridium components;

optionally, at least one rare earth oxide selected from the group consisting of neodymium oxide and lanthanum oxide; and

optionally, a second zirconium oxide; and

5 oxidizing at least some of the hydrocarbon and only a portion carbon monoxide in the presence of the close coupled catalyst.

10 21. The method as recited in claim 20 wherein the oxygen in the close coupled catalyst is substantially provided directly from the exhaust gas stream and from oxygen supplied from the palladium component.

15 22. The method as recited in claim 21 further comprising the steps of passing the exhaust gas from the close-coupled catalyst to a downstream catalyst.

20 23. The method as recited in claim 22 wherein the exhaust gas from the close-coupled catalyst to a downstream catalyst comprises carbon monoxide.

25 24. The method as recited in claim 22 wherein the exhaust gas from the close-coupled catalyst to a downstream catalyst comprises at least 10 percent of the carbon monoxide which passed into the close coupled catalyst when measured according to FTP 1975.

30 25. The method as recited in claim 24 wherein at least 25 percent of the carbon monoxide passes from the close-coupled catalyst.

35 26. The method as recited in claim 25 wherein at least 30 percent of the carbon monoxide passes from the close-coupled catalyst.

27. The method as recited in claim 26 wherein at least 40 percent of the carbon monoxide passes from the close-coupled catalyst.